1986 BMW 635CSi Electrical Troubleshooting Manual

BMW of North America, Inc.
Montvale, New Jersey

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POWER DISTRIBUTION BOX

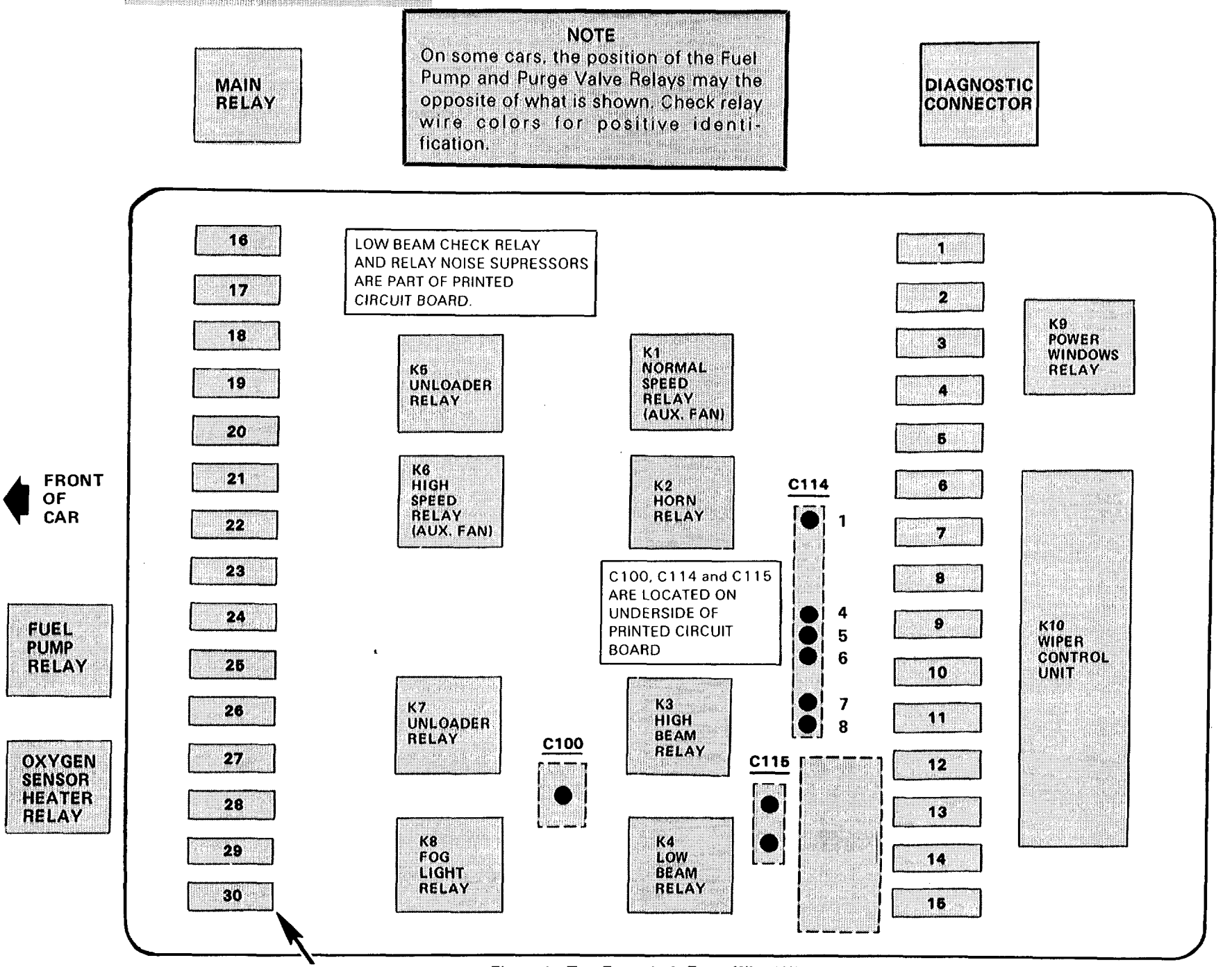
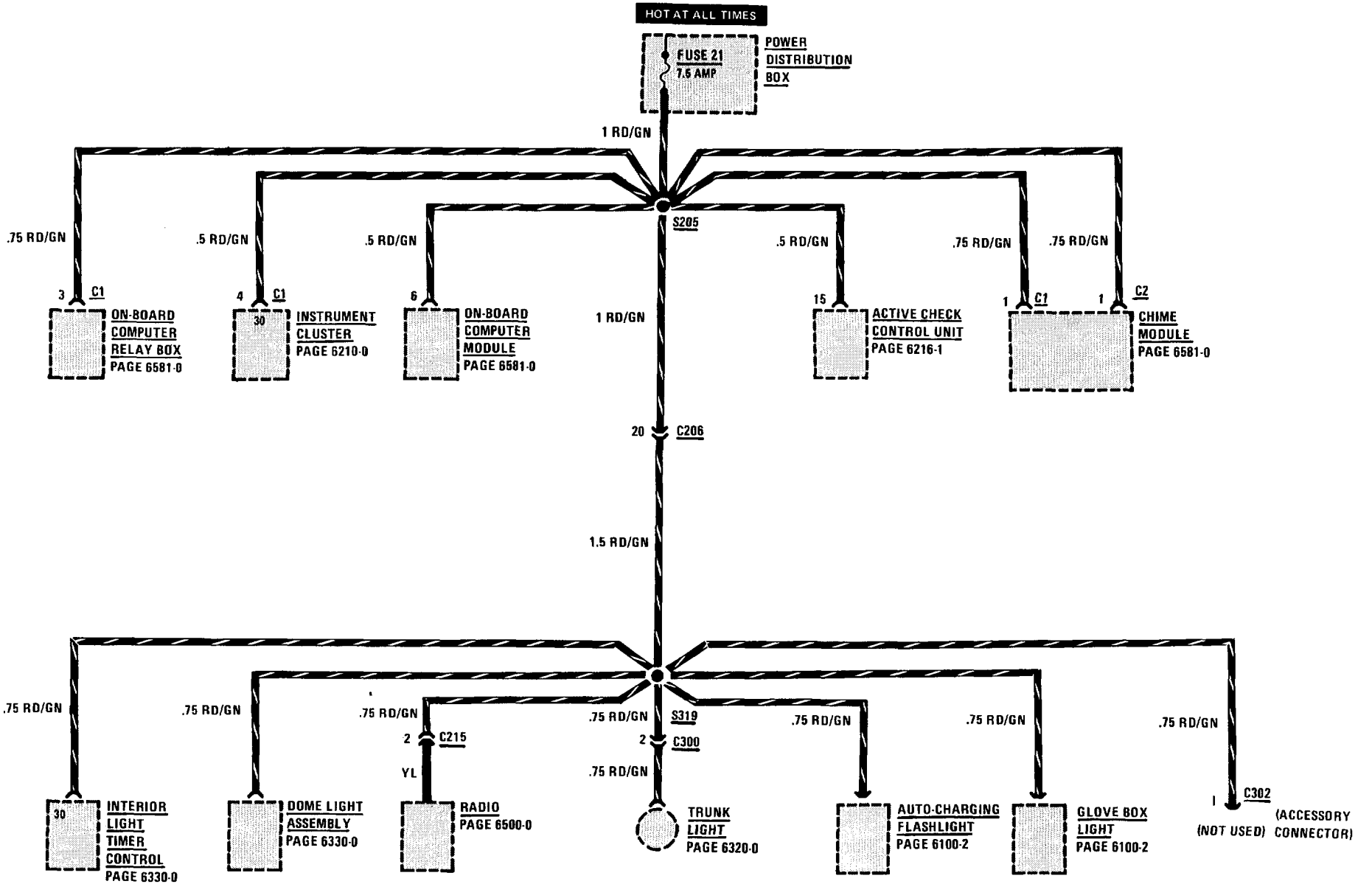
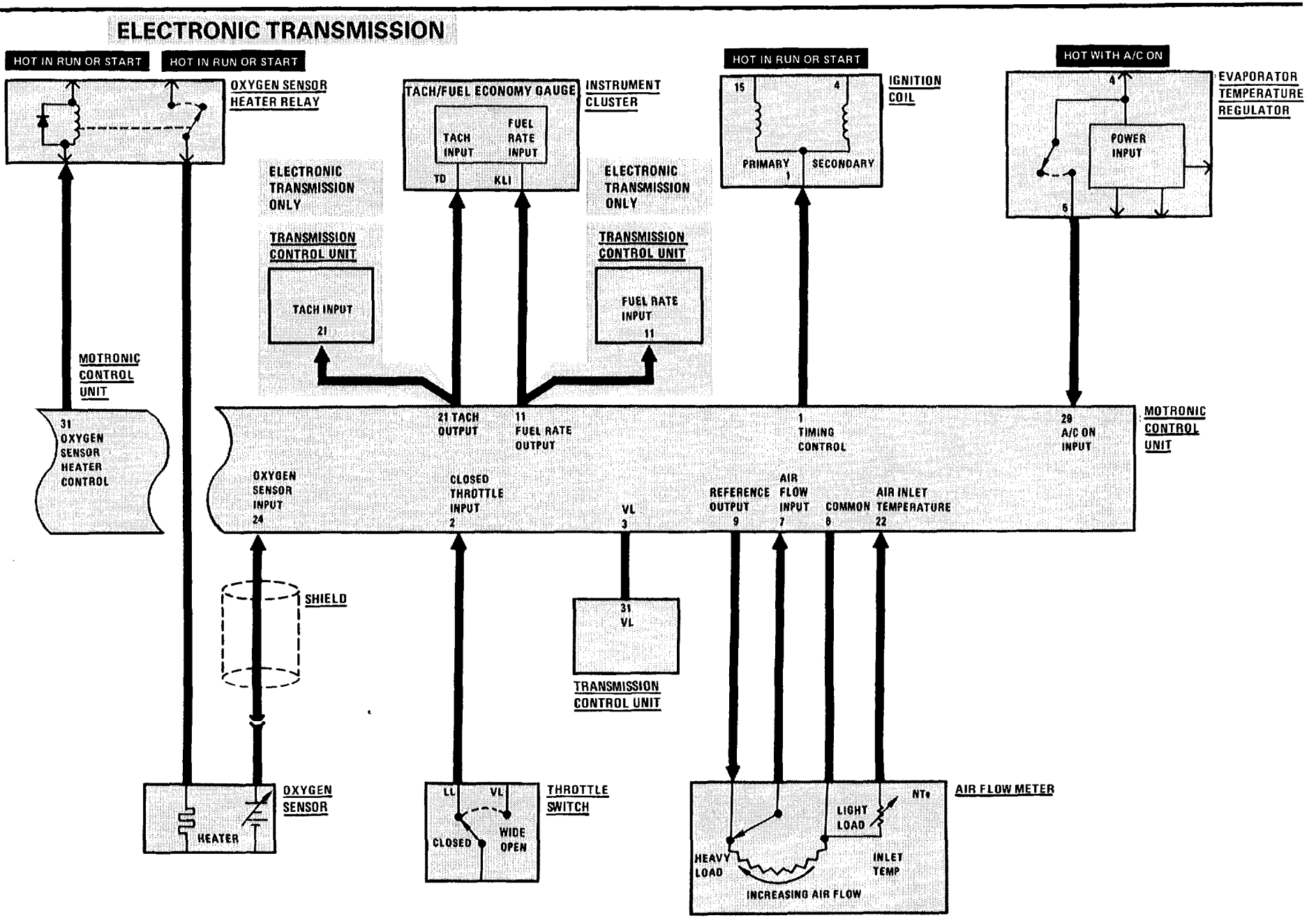


Figure 1 - Top Front Left Front Wheel Well

FUSE DETAILS: FUSE 21



1250-0 ENGINE CONTROL BLOCK DIAGRAM



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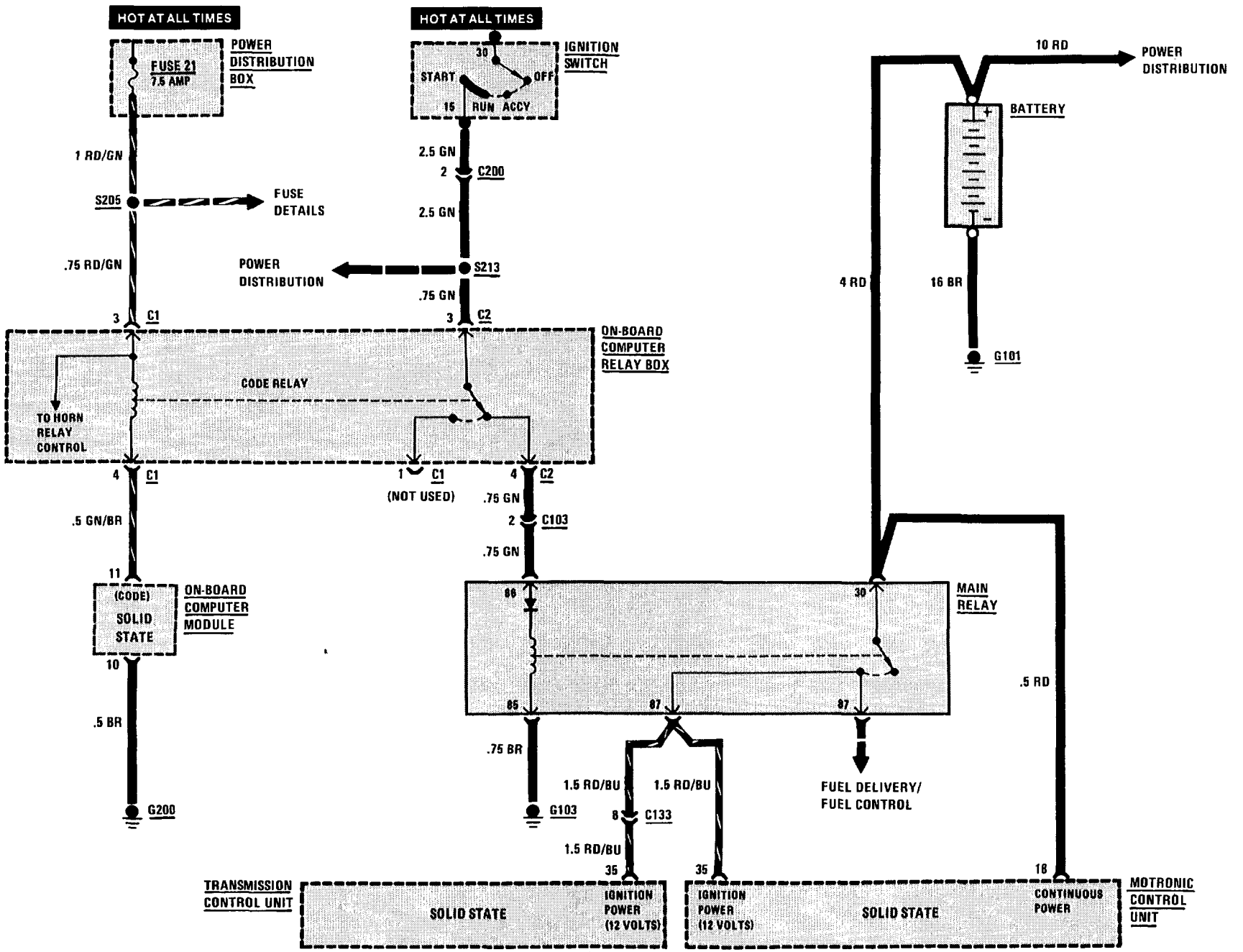
HOT AT ALL TIMES
POWER DISTRIBUTION BOX
FUSE 21 7.5 AMP
1 RD/GN
S205
FUSE DETAILS
.75 RD/GN
3 C1
HOT AT ALL TIMES
IGNITION SWITCH
30
START
OFF
15 RUN ACCY
2.5 GN
2 C200
2.5 GN
POWER DISTRIBUTION
S213
.75 GN
3 C2
ON-BOARD COMPUTER RELAY BOX
CODE RELAY
TO HORN RELAY CONTROL
4 C1
1 C1
(NOT USED)
4 C2
.75 GN
2 C103
.75 GN
.5 GN/BR
11
(CODE)
SOLID STATE
ON-BOARD COMPUTER MODULE
10
.5 BR
G200
10 RD
POWER DISTRIBUTION
BATTERY
4 RD
16 BR
G101
MAIN RELAY
86
30
85
87
87
.5 RD
.75 BR
G103
1.5 RD/BU
1.5 RD/BU
8 C133
FUEL DELIVERY/ FUEL CONTROL
1.5 RD/BU
35
35
16
TRANSMISSION CONTROL UNIT
SOLID STATE
IGNITION POWER (12 VOLTS)
IGNITION POWER (12 VOLTS)
SOLID STATE
CONTINUOUS POWER
MOTRONIC CONTROL UNIT

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(Continued from previous page)

- If all the results are correct, go to the Symptom Table.

1. Go to Test E: Motronic Control Unit Test.
2. Replace the Transmission Control Unit.
3. Check/repair BR wire to terminal 6 of the Transmission Control Unit for an open. Check the connector terminals.
4. Check/repair the wiring to the Throttle Position Sensor. Adjust the Throttle Position Sensor if wiring is OK (See note). Replace the Throttle Position Sensor if adjustment does not correct the problem.

NOTE: The highest voltage at full open position should be .22 volts less than the stabilized voltage. Adjust Throttle Position Sensor accordingly.

CIRCUIT OPERATION

By operating the Program Selector Switch, the driver can select 3 different transmission modes. When the Program Selector Switch is set to E (Economy), the Economy Input (terminal 14) in the Transmission Control Unit is grounded through terminal 6. The Economy Mode is designed for smooth, refined shift points and low fuel consumption. A fourth gear, or overdrive ratio, is available in the Economy Mode to reduce engine speed and noise level. When the Program Selector Switch is set to 321, the 321 Input (terminal 15), in the Transmission Control Unit, is grounded through terminal 6 and the 321 Indicator lights. The Transmission does not shift up or down and will operate in the selected gear only. When the Program Selector Switch is set to S, voltage is present at the Economy and 321 Inputs in the Transmission Control Unit. Fourth gear is not selected and first, second and third gears are kept selected up to full engine speed. The Program Selector Switch is designed to return to E when the engine is cranked. When the engine is cranked, voltage is applied to the coil in the Program Selector Switch through the Ignition Switch and the Start Relay. The coil energizes and the Program Selector returns to E.

The Transmission Control Unit monitors engine speed (terminal 21), fuel rate (terminal 11), Throttle position (terminal 7), road speed (terminals 8 and 27), Kickdown signal (terminal 2), Gear Selector position (terminals 4, 30, 29, 28 and 18) and Program Selector Switch position (terminals 14 and 15). The Transmission Control Unit's electronic processing circuit compares this information with the program data to establish the correct gear and smooth shift points, by controlling the Shift Valve Solenoids and the Hydraulic Pressure Regulator.

The Transmission Fault Indicator will light with the engine running, if a problem with the control system occurs. When a fault is detected, the vehicle can only be driven in third and reverse gears. Neutral and Park also retain their functions. Voltage to the transmission (terminal 1) is not present when a fault is detected.

The Reverse Gear Inhibit Lock Solenoid prevents the driver from selecting reverse above 5 mph.

A: CONTROL UNIT LOCK TEST (TABLE 1)

Measure: VOLTAGE
At: CONTROL UNIT CONNECTOR
(Connected)

Measure Between	Correct Voltage	For Diagnosis
3 (RD/BK) & Ground	Battery	See 1
3 (RD/BK) & 4 (BR)	Battery	See 2

- If the voltages are correct, proceed to Table 2.

1. Check the RD/BK wire for an open.
2. Check the BR wire for an open to ground (see schematic).

A: CONTROL UNIT LOCK TEST (TABLE 2)

Connect: A FUSED JUMPER
At: CONTROL UNIT CONNECTOR
(Connected)

Jumper Between	Correct Result	For Diagnosis
7 (YL/BU) & Ground	Doors lock	See 1

- If the result is correct, repair/replace the switches and related wiring (see schematic).

1. Proceed to Table 3.

A: CONTROL UNIT LOCK TEST (TABLE 3)

Connect: FUSED JUMPERS
At: CONTROL UNIT CONNECTOR
(Disconnected)

Jumper Between	Correct Result	For Diagnosis
1 (BU) & 3 (RD/BK) 2 (WT) & 4 (BR)	Doors lock	See 1

- If the result is correct, replace the Central Locking Control Unit.

1. Check the BU wire to splice S302 and the WT wire to splice S303 for opens (see schematic).

B: UNLOCK INHIBIT TEST

Connect: A FUSED JUMPER
At: CONTROL UNIT CONNECTOR
(Connected)

Jumper Between	Correct Result	For Diagnosis
10 (VI) & Ground	Doors double lock	See 1

- If the result is correct, check the VI, and WT/BK wires for opens (see schematic). Replace the Unlock Inhibit Switch if the wires and connections are OK.

1. Check the BK/RD wires for opens (see schematic). Replace the Central Locking Control Unit, if the wires and connections are OK.

C: CONTROL UNIT UNLOCK TEST

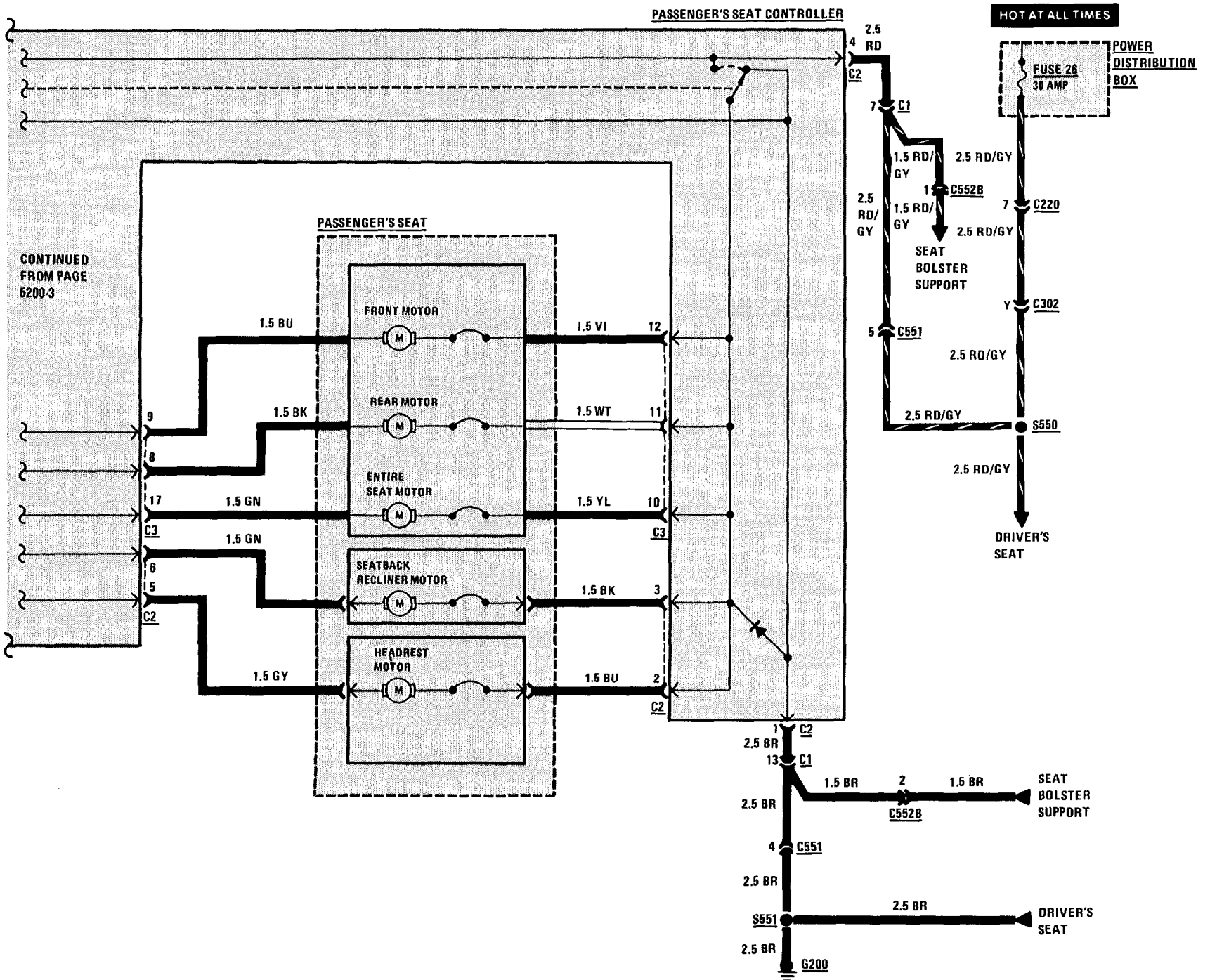
Connect: A FUSED JUMPER
At: CONTROL UNIT CONNECTOR
(Connected)

Jumper Between	Correct Result	For Diagnosis
6 (GN/BU) & Ground	Doors unlock	See 1

- If the result is correct, repair/replace the switches and related wiring (see schematic).

1. Replace the Central Locking Control Unit.

PASSENGER'S SEAT



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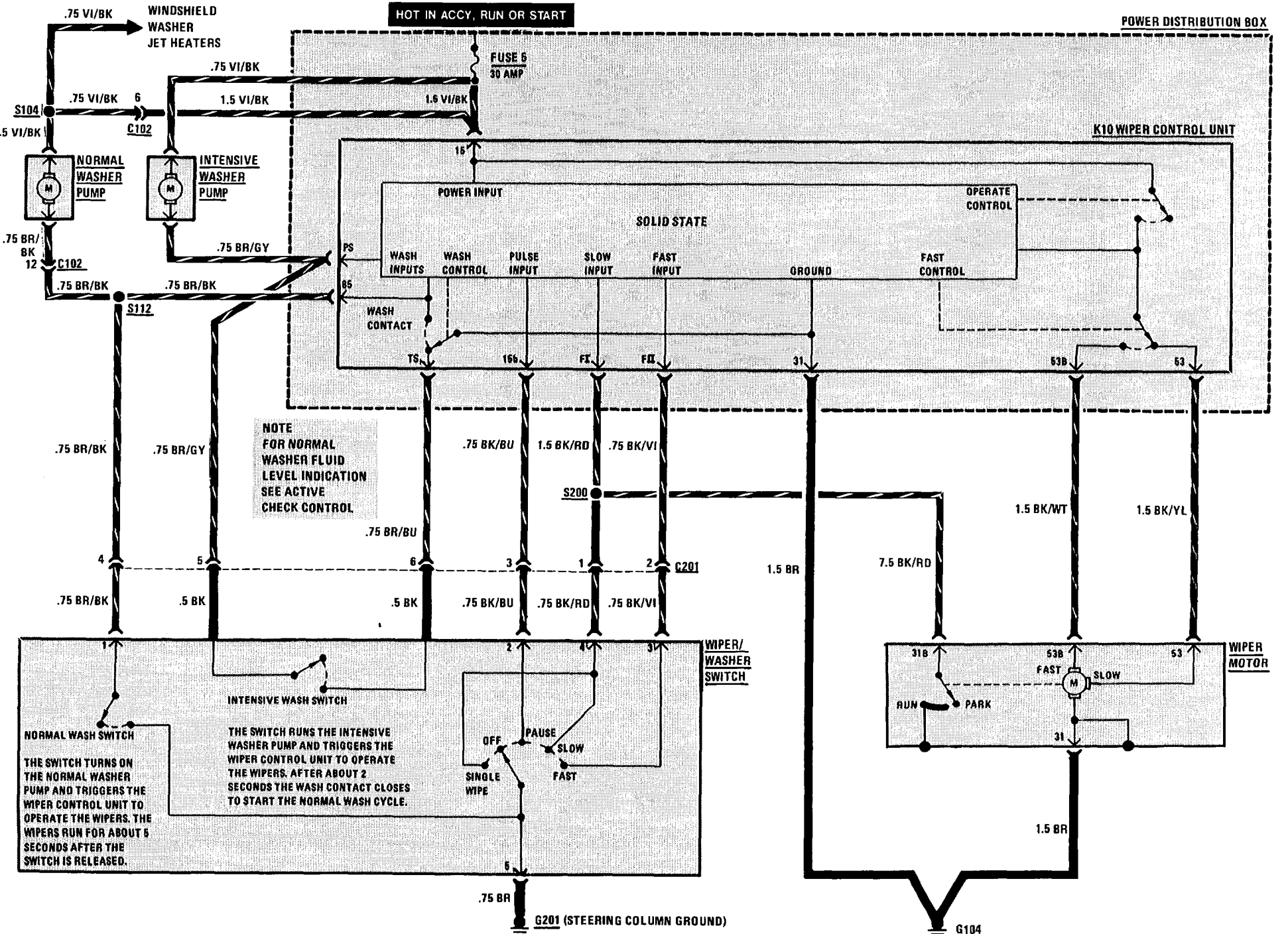
6160-0 WIPER/WASHER



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ACTIVE CHECK CONTROL

1. When the Ignition Switch is initially placed in "Run," the Active Check Control Arm Indicator flashes, and the Active Check Control Unit Brake Light LED and panel light illuminate for test purposes. Depressing the brake pedal clears the display.

2. When the Ignition Switch is placed in "Run," fault monitoring begins. To monitor the low beams, rear lights, or license lights, those circuits must be on. The brake lights are monitored only while the brake pedal is depressed.

3. When a fault occurs, the alarm indicator flashes , the appropriate LED fault indicator lights, and the panel light goes on for five seconds. Depressing the test button will clear the alarm indicator, but the LED fault indicator remains on.

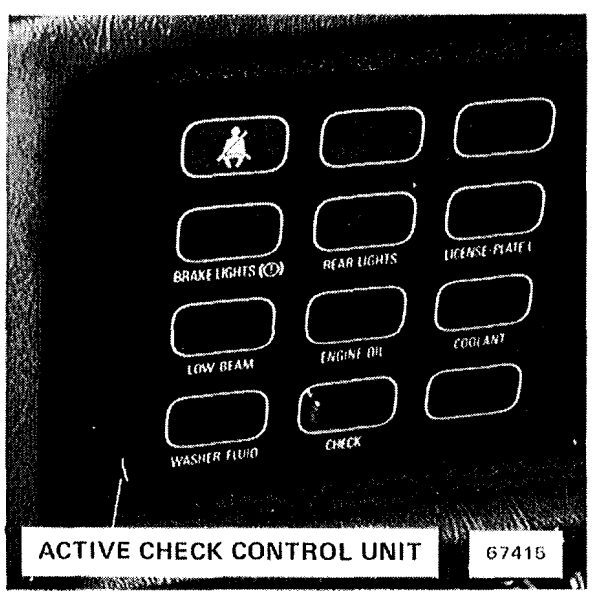
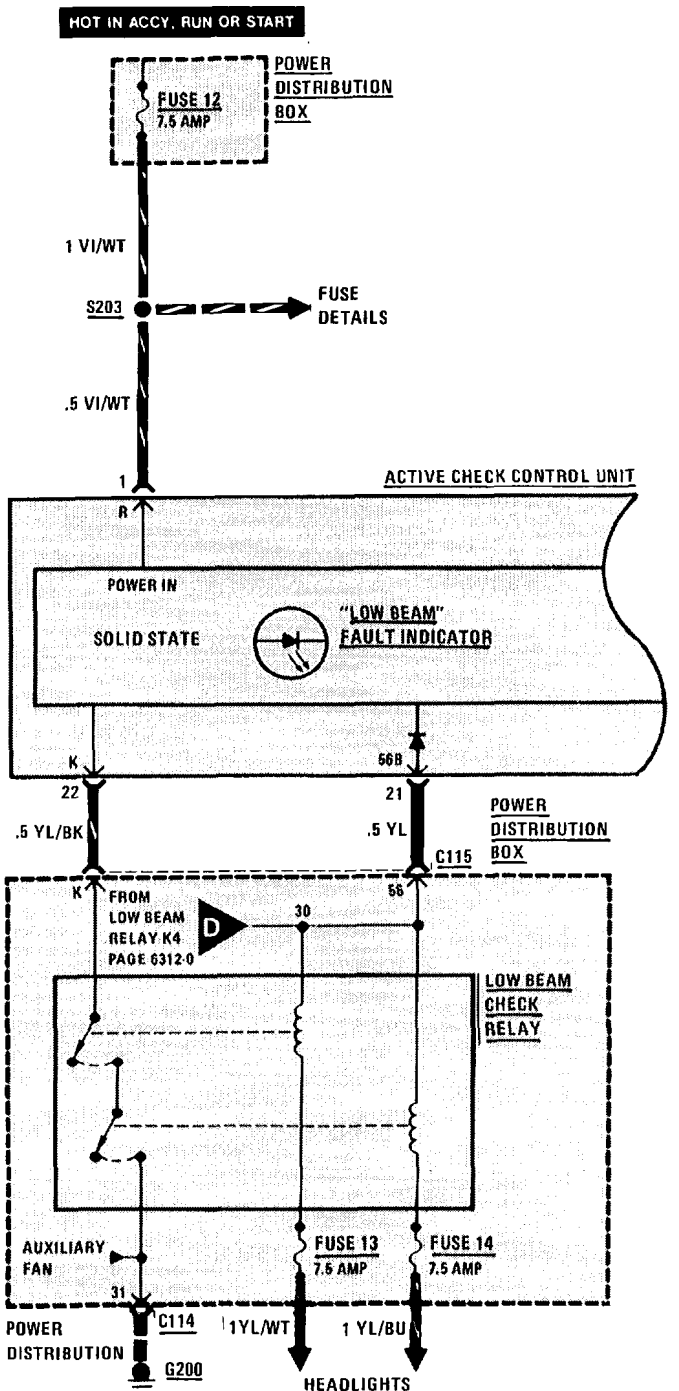
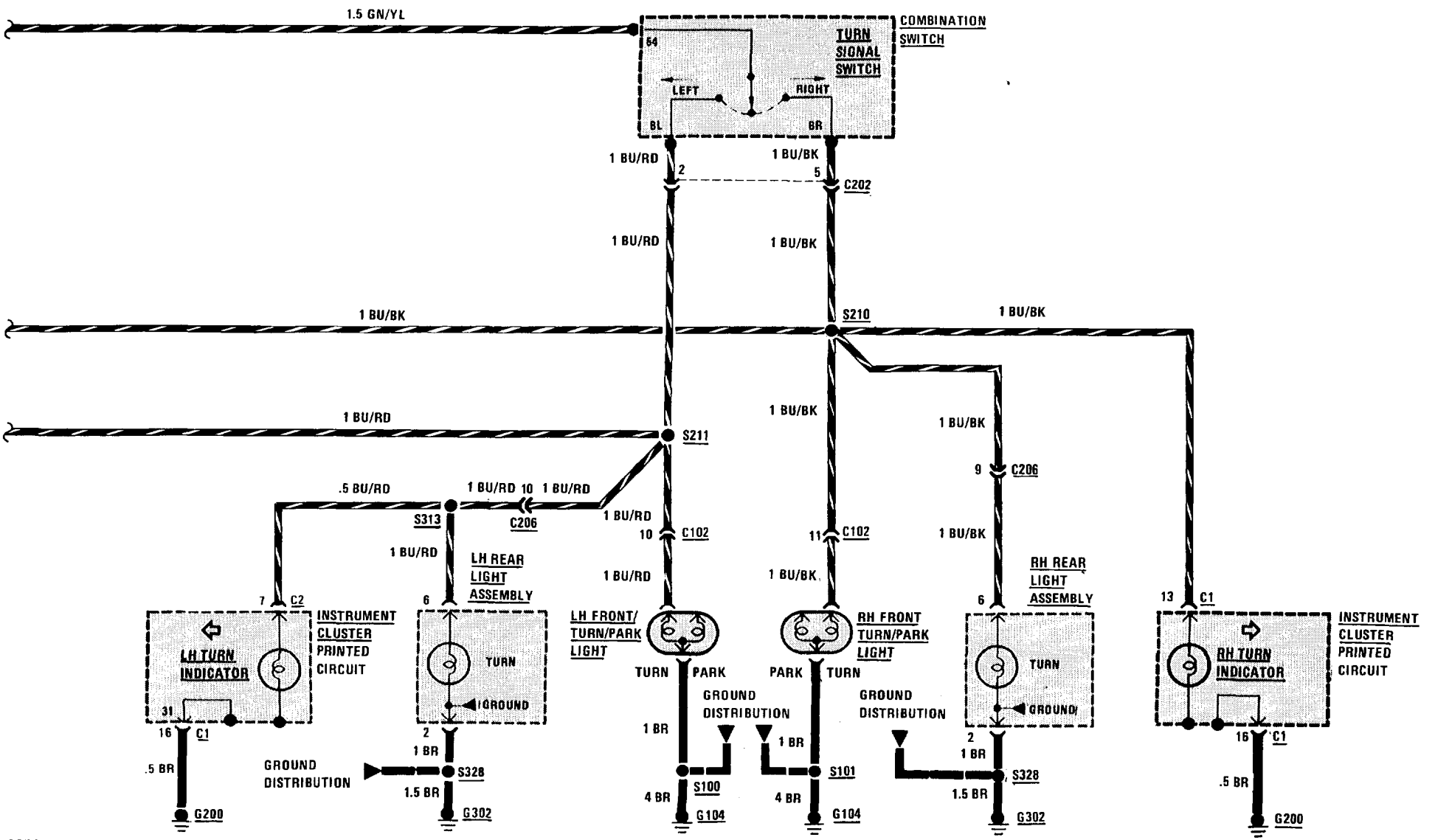


Figure 1 - Active Check Control Unit (Dash, Left Of Steering Column)

4. To test the unit, depress the test button. The LED fault indicators and the panel lights should go on.




1.5 GN/YL
COMBINATION SWITCH
54
TURN SIGNAL SWITCH
LEFT
RIGHT
BL
BR
1 BU/RD
1 BU/BK
2
5
C202
1 BU/RD
1 BU/BK
1 BU/BK
S210
1 BU/BK
1 BU/RD
S211
1 BU/BK
1 BU/BK
9
C206
.5 BU/RD
1 BU/RD
10
1 BU/RD
S313
C206
1 BU/RD
10
C102
11
C102
1 BU/BK
1 BU/RD
LH REAR LIGHT ASSEMBLY
1 BU/RD
1 BU/BK
RH REAR LIGHT ASSEMBLY
7
C2
6
6
13
C1
INSTRUMENT CLUSTER PRINTED CIRCUIT
LH TURN INDICATOR
TURN
GROUND
LH FRONT/ TURN/PARK LIGHT
RH FRONT TURN/PARK LIGHT
TURN
PARK
PARK
TURN
TURN
GROUND
RH TURN INDICATOR
INSTRUMENT CLUSTER PRINTED CIRCUIT
31
16
C1
2
1 BR
GROUND DISTRIBUTION
1 BR
GROUND DISTRIBUTION
1 BR
GROUND DISTRIBUTION
2
1 BR
16
C1
.5 BR
S328
1.5 BR
S100
4 BR
S101
4 BR
S328
1.5 BR
.5 BR
G200
G302
G104
G104
G302
G200

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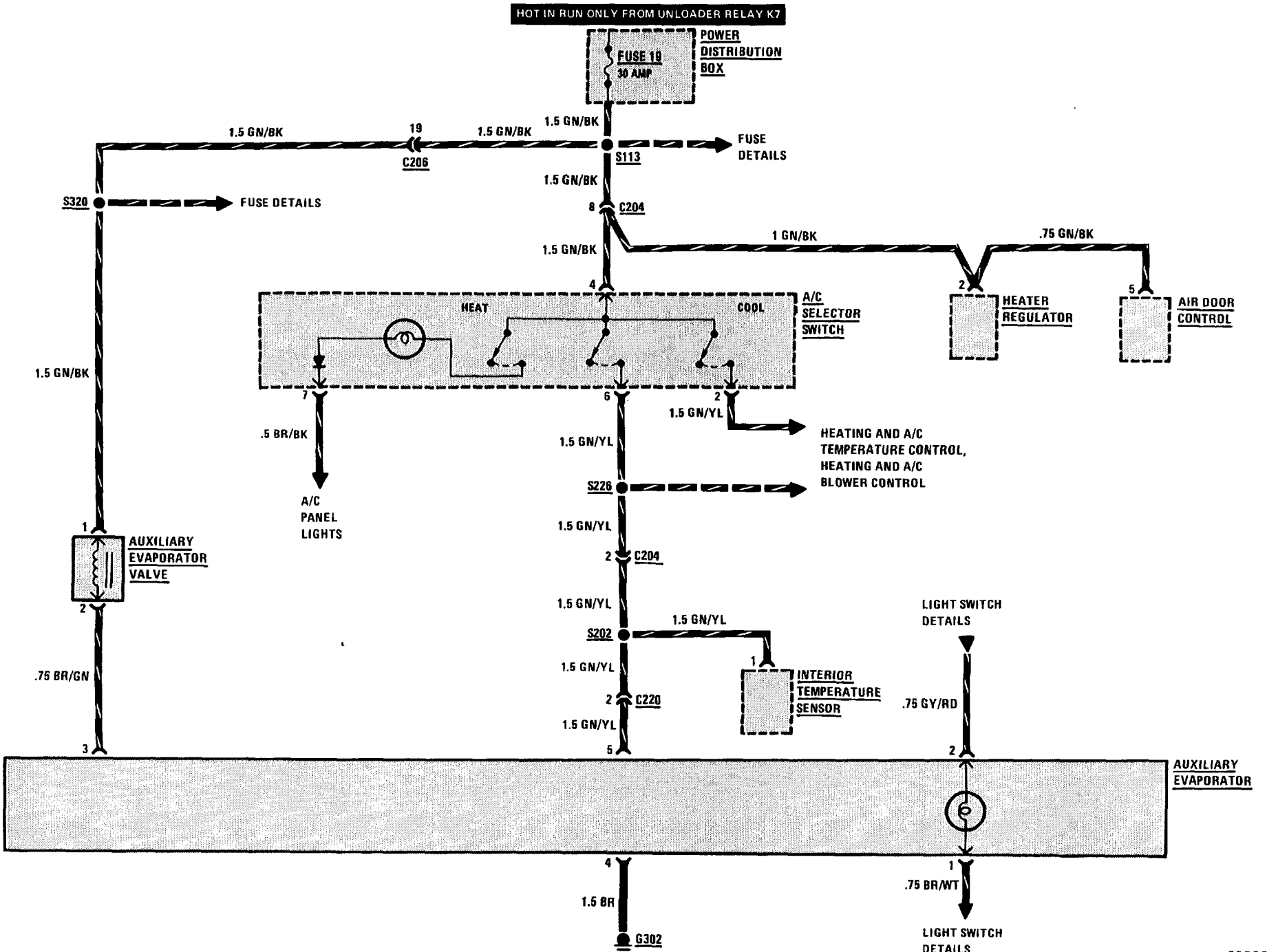
LATE PRODUCTION ONLY



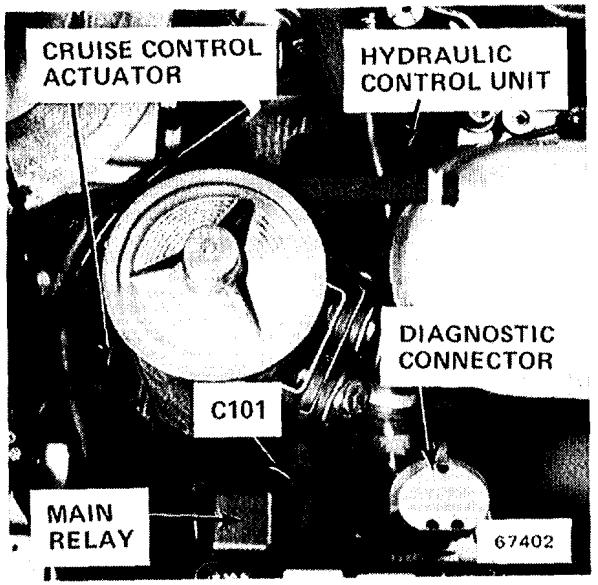


Figure 1 - Right of Left Front Wheel Well

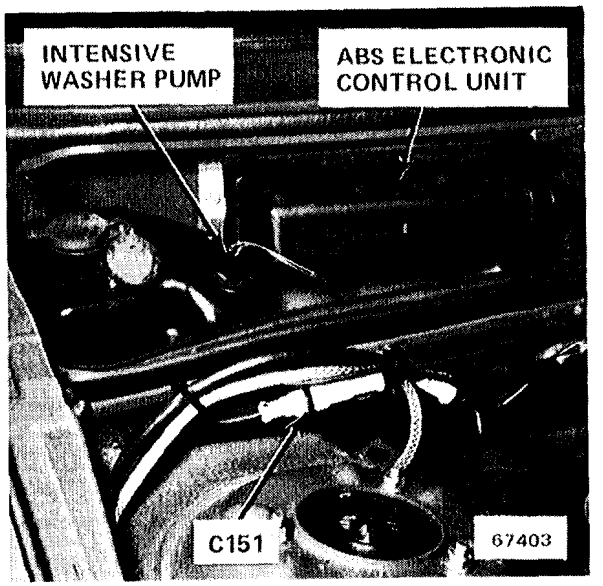


Figure 3 - RH Rear Corner of Engine Compartment

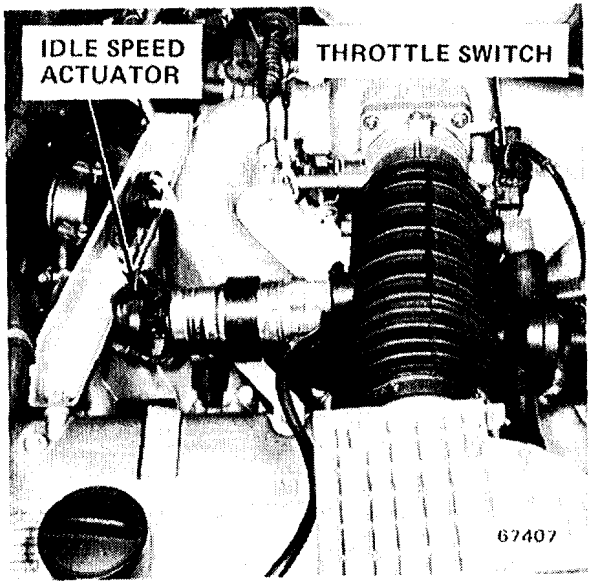


Figure 5 - Top Center of Engine

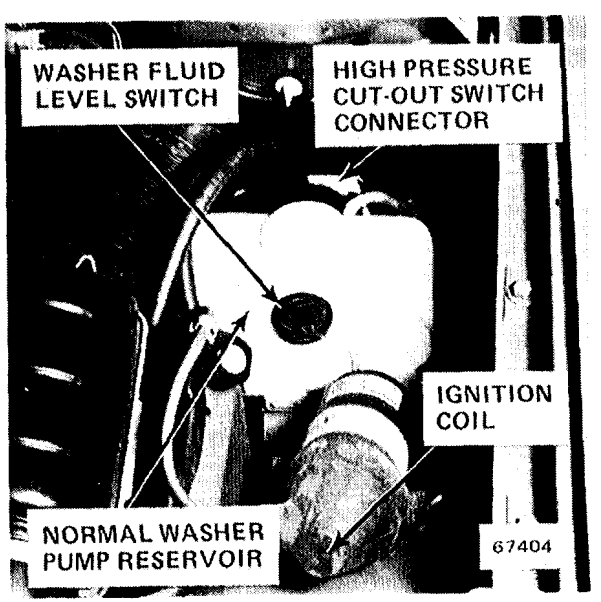


Figure 2 - Ahead of Right Front Wheel Well

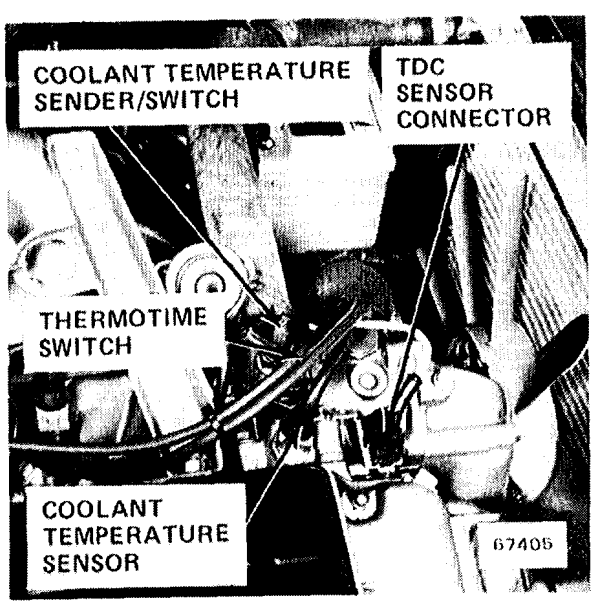


Figure 4 - Top Front of Engine

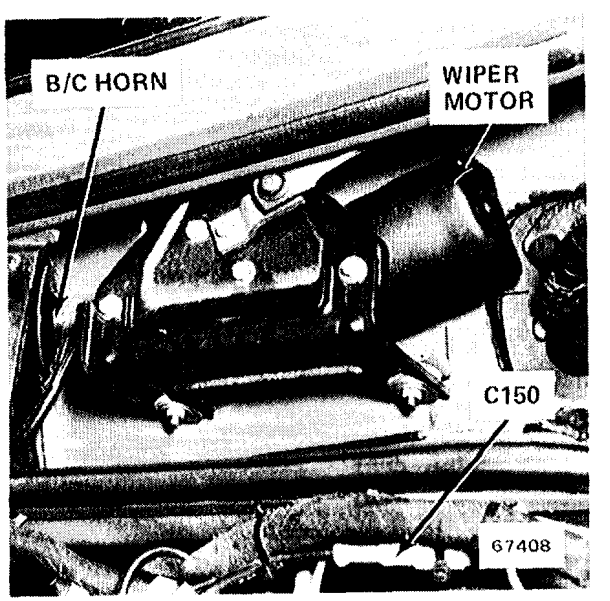
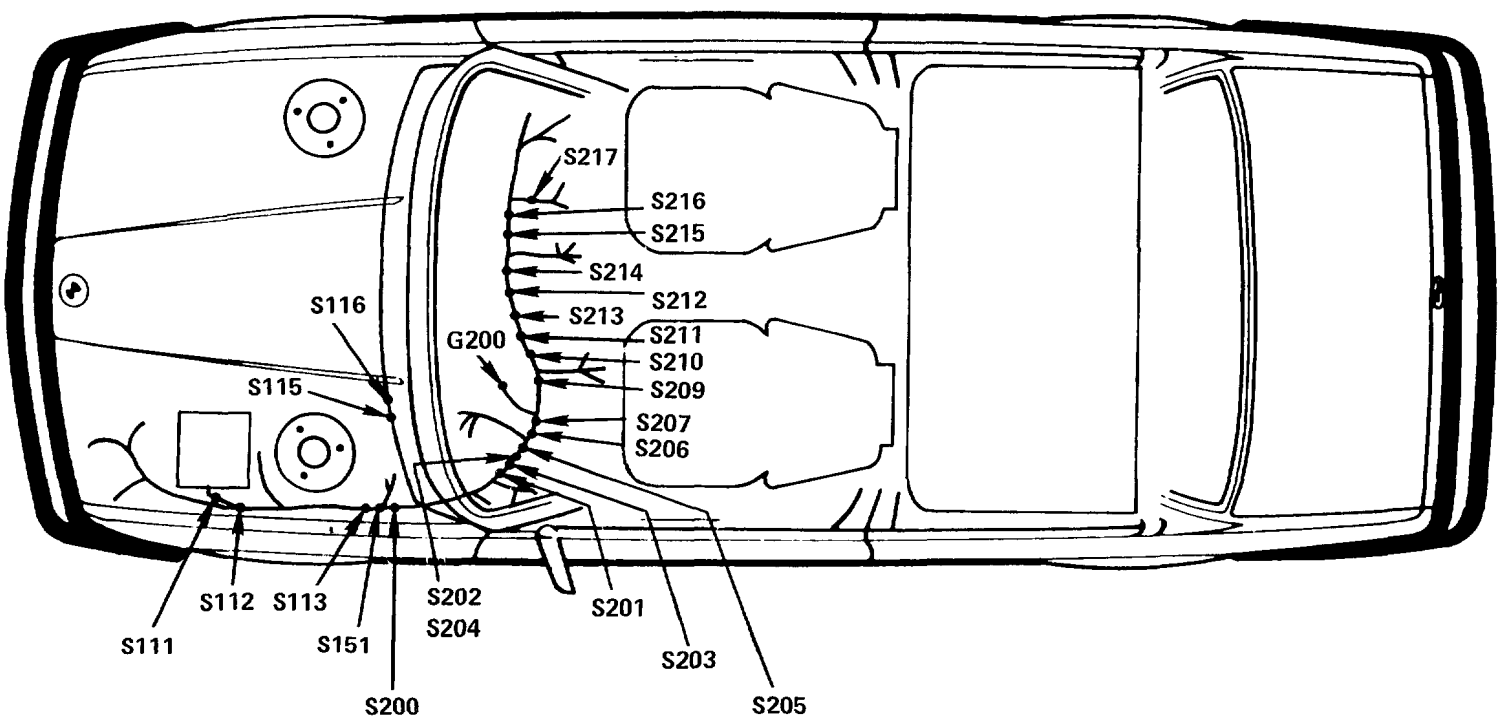
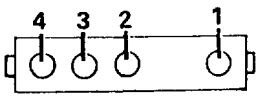


Figure 6 - Under Left Side of Cowl

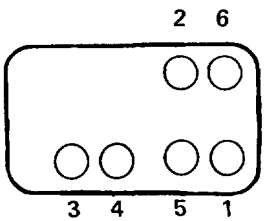
MIDDLE HARNESS





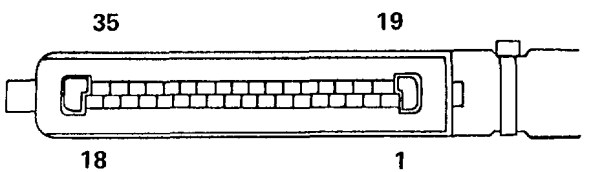
Wiring Face

MIRROR



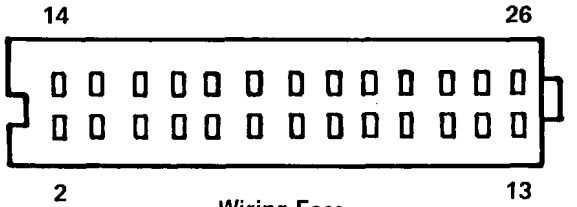
Mating Face

MIRROR CONTROL SWITCH



Mating Face

MOTRONIC CONTROL UNIT

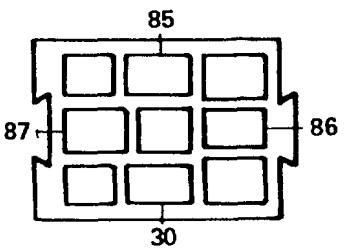


Wiring Face

ON BOARD COMPUTER MODULE

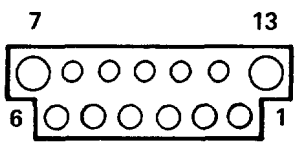
Wiring Face C1 | Wiring Face C2

ON-BOARD COMPUTER RELAY BOX



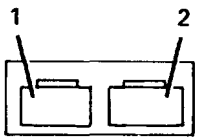
Wiring Face

OXYGEN SENSOR HEATER RELAY



Wiring Face

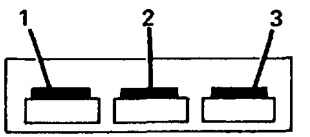
PASSENGER SEAT CONTROLLER (C1)



Wiring Face

PROGRAM SWITCH (C1)

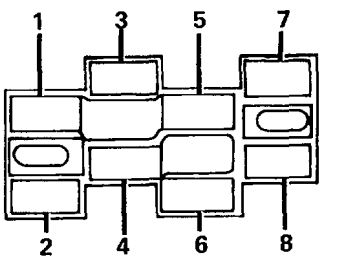
(ELECTRONIC TRANSMISSION)



Wiring Face

PROGRAM SWITCH (C2)

(ELECTRONIC TRANSMISSION)



Wiring Face

REAR DEFOGGER SWITCH